Integrated Remote Control Of The Roland Digital Snake From Select Yamaha Digital Consoles

This document outlines the procedures for controlling an S-4000 Modular Digital Snake using the hardware and software of select Yamaha digital mixing consoles.

The S-4000 Modular Digital Snake provides source audio from very high quality, 24-bit 96kHz mic preamps delivered over lightweight and inexpensive Cat5e cable. The high quality XR-1 mic preamps in the S-4000 system can be controlled and the settings stored using the HA Remote port and related software in the Yamaha consoles.

In a typical system configuration, the S-4000S-3208 would reside on stage. The source audio would be distributed using Cat5e cable to an S-4000H at the front of house position. The outputs and returns of the S-4000H would be connected to the Yamaha console's analog inputs and outputs using breakout cables, providing the stage audio to the console. The gain structure of the S-4000S-3208 on stage would then be controlled from the Yamaha console's user interface.

The S-4000 system can also by connected digitally to the Yamaha console using an S-4000 configured with SI-AES4 and SO-AES4 AES/EBU input and output cards. The cards would be connected to the Yamaha console via Yamaha's mini YGDAI AES/EBU cards such as the MY16-AE.This configuration provides for a completely digital system from the stage to the console.

The following document outlines the basics of an S-4000 Modular digital snake and how to connect it and control it from select Yamaha digital consoles.
Using an S-4000 digital snake with a Yamaha digital console offers the S-4000 system's advantages of low-cost, lightweight Cat5e cable, immunity to hums and buzzes and great-sounding XR-1 mic preamps along with convenient control and recall of they system's gain settings directly from the Yamaha digital consoles' user interface.

S-4000S MODULAR DIGITAL SNAKE
The S-4000 Modular Digital Snake provides 40 channels of 24-bit 96kHz audio via Cat5e cables. It is comprised of an S-4000S Stage Unit and either an S-4000H FOH unit or a complementary S-4000S Stage Unit for use at the FOH position. The S-4000 Digital Snake provides Cat5e redundancy as well as optional redundant power supplies in order to maximize reliability. S-4000 systems can be ganged for a maximum of 160 channels. Individual S-4000 systems can also be short-loaded to accommodate smaller systems or systems that vary from the standard 32x8 configuration. The S-4000S Stage Unit is modular, providing a wide array of input and output configurations. Optional AES/EBU modules are available to replace the

standard analog modules. The S-4000's source inputs can be digitally split using standard Ethernet gigabit switches and the system's very high quality preamps can be remotely controlled for fast and convenient management of their gain structure.

YAMAHA CONTROL OF THE S-4000 STAGE UNIT

Select Yamaha consoles have built-in software to control the optional Yamaha AD8HR remote-controlled input modules. This remote control protocol can also be used to control the ROLAND S-4000 Digital Snake's preamp, pad and phantom power settings.

To accomplish this, the RS-232c port found on the S-4000H FOH Unit or the S-4000S Stage Unit (normally used for the connection of an S-4000R Remote Control) can be connected (via a converter) to the RS422 HA REMOTE or REMOTE control port on the Yamaha console.

Once this connection is made, the software in the Yamaha console can be used to control the S-4000's Gain structure and Phantom Power.

Since there is no PAD button in the Yamaha console, the S-4000 software smoothly and seamlessly adjusts from -65 to +10 dB by automatically implementing the S-4000 pad function at the appropriate control level from the Yamaha console.

Configuring a Yamaha console with the S-4000 Digital Snake offers the overall system very high quality audio with convenient control provided directly from the mixer's software. Preamp Gain and Phantom power settings can also be stored as Yamaha Scenes or Libraries for fast system setup.

THE AUDIO PATH USING AN S-4000 SYSTEM AND A YAMAHA CONSOLE

The audio from the S-4000 system can be connected directly from an S-4000H or S-4000S using standard analog cabling into the normal Yamaha channel mic/line inputs or using analog line input cards in the optional mini YGDAI card slots.

The audio can also be connected digitally via S-4000 AES/EBU modules into the Yamaha input slots provided with the optional YGDAI AES/EBU cards.
Since the S-4000 AES/EBU cards have built-in Sample Frequency Rate conversion, the Yamaha console can be run at 44.1KHz, 48KHz or 96kHz. This configuration provides a totally digital path from the stage to the console's outputs (and back to stage, if desired).

You can control up to 40 channels of preamp gain from the S-4000 system using the supported Yamaha consoles.

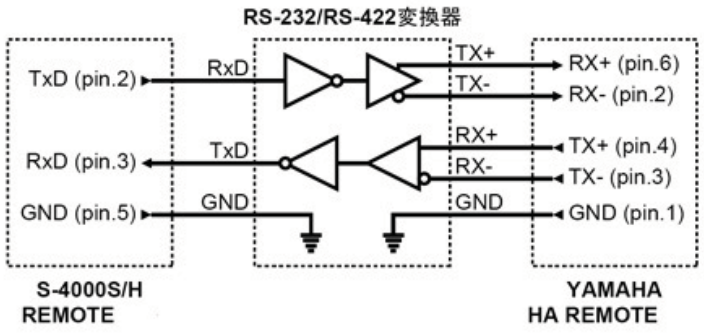
SOFTWARE UPDATE FOR THE S-4000 SYSTEM
To implement the Yamaha control of an S-4000 system, the S-4000 system must be updated to software version 1.5 or later, which includes the Yamaha console support. This software update is required only for the S-4000S and S-4000H units. An update is not needed for the S-4000R remote control unit.

SUPPORTED YAMAHA CONSOLES
The following Yamaha consoles can be used to control the S-4000S's preamp settings:
DM1000
DM2000
PM5D
PM5D-RH
M7CL

CONNECTION TO THE YAMAHA CONSOLE
The HA REMOTE control port on the Yamaha is a balanced 9-pin RS-422 male connector. The S-4000R control port on the S-4000S or S-4000H is a female 9-pin RS-232c port.

To connect the two systems, you must use an approved RS-422 to RS-232c adapter with the correct pin configuration.

Please check the accompanying diagrams for details on the correct interface specification.

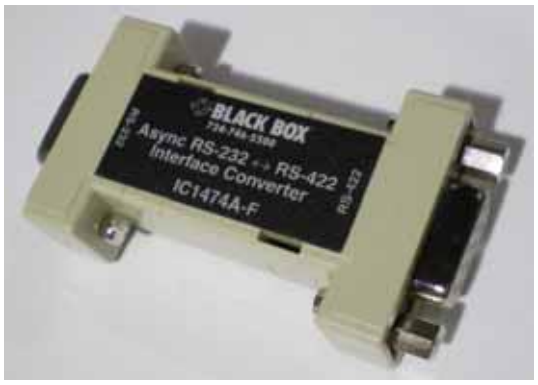


Note that manufacturers often implement different pin configurations for their 422 to 232 adapters. For this reason it is important to be sure that "TX" means "where to connect the RX from the source" because sometimes it can mean "where to connect the TX from the source". Documentation that comes with the adapter should show the exact pin configuration of the adapter.

Some manufactures have both a DTE mode and a DCT mode for their adapter.
It is easiest to adapt to the S-4000 using the DCT mode.

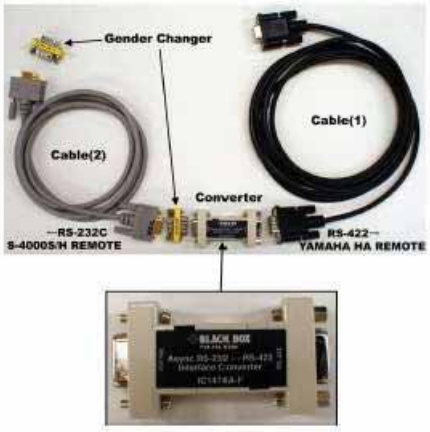
The Yamaha HA REMOTE port is a MALE port, so it requires a female connector on the connection cable. The Roland side has a FEMALE chassis connection, so a male cable end is required. Be sure the cable that is used is a "straight thru" cable, or the pin configurations will be changed.

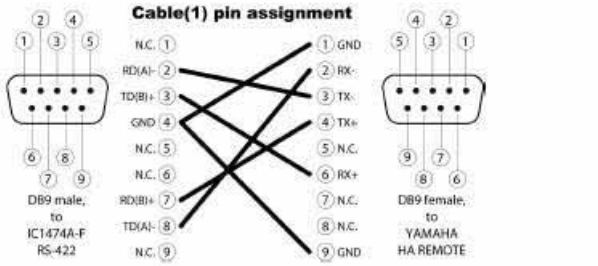
Currently there are two tested and approved RS-422 to 232c adapters which are listed here. Please check with the RSG support team at 800-380-2580 for updates to this list.

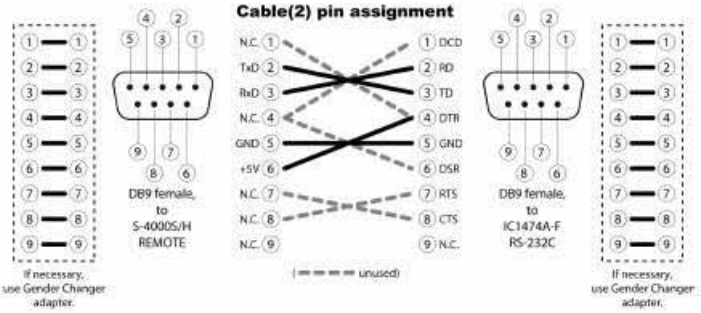


Black Box model# IC1474A-F (RECOMMENDED)
http://www.blackbox.co.uk/technical/manuals/I/IC1474A-F%20Manual.pdf
This adapter is very compact, does not need any modification, and the power is supplied directly from the 422 port. It does require special cables, however.

· Example: IC1474A-F, BLACK BOX Network Services







※ You can use "**null modem cable**" or "**crossover (reverse) type serial cable**" for **Cable(2)**.

NOTE: Always wire ONLY the connections shown; do not leave grayed-out or not-shown wires connected.

Integrity Instruments model# XP-422-9A

http://www.integrityusa.com/converteritemw.asp?record=50#
To use this adapter you need to change the mode to DCT using the internal DIP switch.
This adapter has a screw terminal on the RS-422 side. You will need a female-ended cable that can be cut so that you can wire the connectors to the adapter using the screw terminals and connect to the Yamaha console using the female cable end.
Power should be supplied using the adapter that comes with the unit.

YAMAHA CONTROL
Once the systems are properly configured, you can use the HA REMOTE control knobs found in the Yamaha console's software to control the Gain levels and Phantom Power settings for the S-4000.

CONFIGURING THE YAMAHA CONSOLE'S SOFTWARE

PM5D
Connect the RS-422 to RS-232c adapter to the port labeled HA REMOTE
(This is a DB9 pin MALE connector on the Yamaha chassis)

Go to SYS/W CLOCK section and select the HA tab
Choose the REMOTE HA tabs 1-4

Use these Knobs and Phantom Power switches to control the S-4000's gain

Use the HA Library for saving setups.

When the connection is working a green “HA” will appear on the RH side of the top permanent information bar in the software when any setting is changed. If you don’t see this indicator, check the cables for the RS-422 to RS-232 adapter and reboot the PM5D.

DM-1000
Connect the RS-422 to RS-232 adapter to the REMOTE serial port.
(This is a DB9 pin MALE connector on the Yamaha chassis)

Press the SETUP Menu button multiple times until you see the REMOTE Tab.

In the REMOTE FUNCTION drop down menu choose HA Control.

You can then vary the S-4000’s settings using the Knobs and Phantom Power buttons found for HA ID#1, 2, 3 and 4.

DM-2000
Connect the RS-422 to RS-232 adapter to the REMOTE serial port
(This is a DB9 pin MALE connector on the Yamaha chassis)

Choose the SETUP Menu.

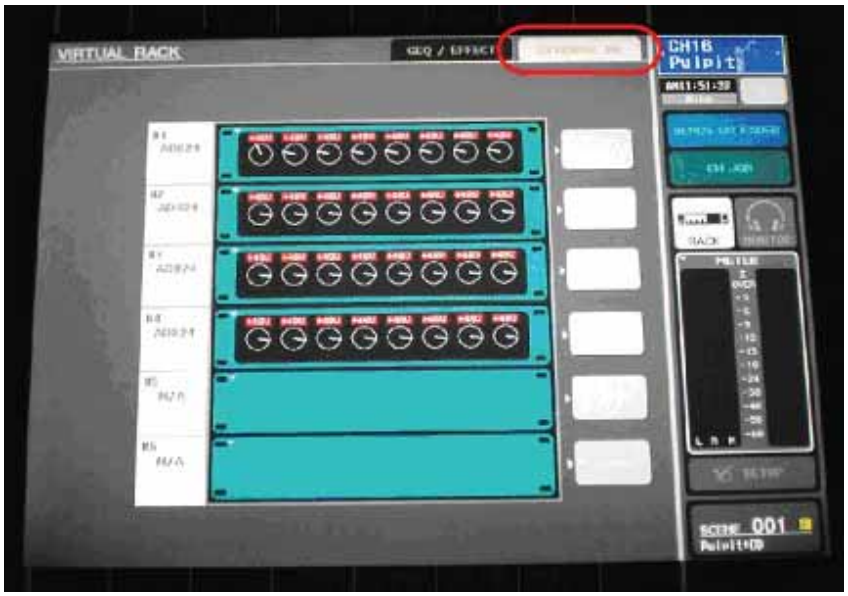
Press the SETUP Menu button or use the PAGE > button until you see REMOTE.

In the REMOTE FUNCTION choose HA.

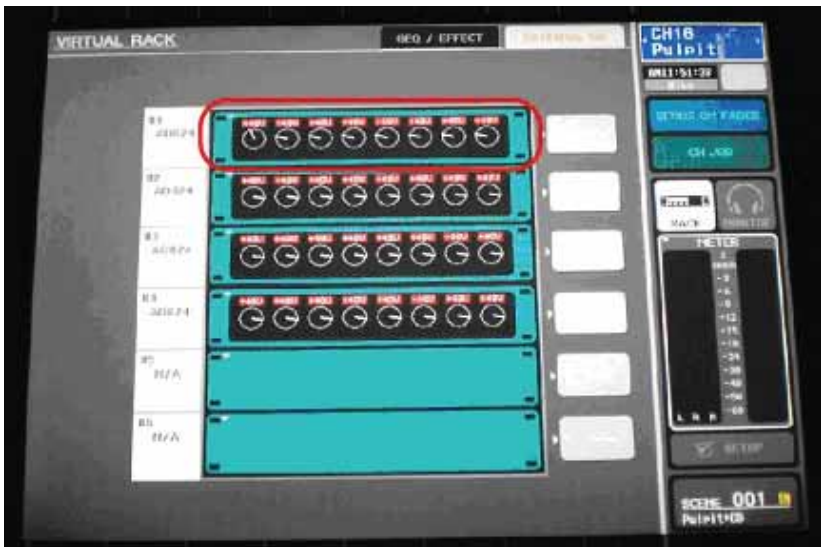
Select HA CONTROL and press ENTER.

Use the Knobs and Phantom Power buttons found for ID#1, 2, 3, and 4.

M7CL
After booting up the M7CL, press the “Rack” button on the Home screen.

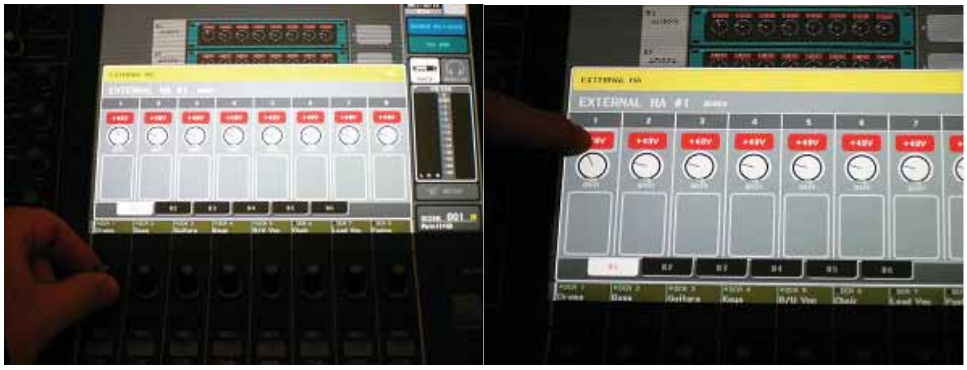


Press the “EXTERNAL HA” tab (you will see the current setup of VIRTUAL RACK).



You will find 4 groups of 8 input channels (when a 32x8 Roland Digital Snake system is connected; a modified Roland Digital Snake will show the corresponding number of available input channels). Select the bank that contains the channel you want to adjust.

Now you are seeing a bank of 8 input channels.



You can adjust the gain of a specific input by adjusting the corresponding trim control knob. You can also toggle phantom power by touching the +48v button on your HA Remote screen.

Be sure to properly map your console inputs to your HA Remote channels. The M7CL allows you great flexibility in mapping inputs to control strips, so be sure your setup is correct.

WARNING
To prevent possible damage to the Roland S-4000 system and the Yamaha Console, you MUST use an RSG approved RS-422 to RS-232c adapter when connecting the two systems. Refer to the appropriate Yamaha owner's manual for use and configuration of all related Yamaha products.

LIABILITY
In no event shall Roland Systems Group ("Roland") be liable to end users for any damages whatsoever, including but not limited to financial damages for damage to the Yamaha console, loss of business profits, and any other form of loss arising from the use of, or inability to use a Roland product in conjunction with a Yamaha console or any other product. The foregoing provision is effective even if Roland has been advised of the possibility of such damages.

For direct support on controlling your Roland Digital Snake with a Yamaha console, please contact Technical Support at Roland Systems Group: 1-800-380-2580.